AMENDMENTS TO THE CLAIMS

1. (Original) A binder for electrode of lithium ion secondary battery, which comprises a copolymer comprising:

15 to 80 weight% of units from an ethylenically unsaturated monomer (A) whose homopolymerization yields a polymer soluble in N-methylpyrrolidone (NMP); and

20 to 85 weight% of units from an ethylenically unsaturated monomer (B) whose homopolymerization yields a polymer insoluble in NMP;

which copolymer exhibits a swelling degree of 4 or below in an electrolyte obtained by dissolving $LiPF_6$ in the concentration of 1 mole/liter into a solvent of 1:2 (volume ratio at 20°C) mixture of ethylene carbonate (EC) and diethyl carbonate (DEC).

2. (Previously Presented) A binder for electrode of lithium ion secondary battery, which comprises a copolymer obtained by multistage-polymerizing comprising:

15 to 80 weight % of a component comprising at least one ethylenically unsaturated monomer whose homopolymerization yields a polymer soluble in N-methylpyrrolidone (NMP) (component (a)); and

20 to 85 weight % of a component comprising at least one ethylenically unsaturated monomer whose homopolymerization yields a polymer insoluble in NMP (component (b));

which copolymer exhibits a swelling degree of 4 or below, in an electrolyte obtained by dissolving $LiPF_6$ in the concentration of 1 mole/liter into a solvent of 1:2 (volume ratio at 20°C) mixture of ethylene carbonate (EC) and diethyl carbonate (DEC).

3. (Original) The binder for electrode of lithium ion secondary battery according to claim 2, wherein the multistage polymerization comprises a first polymerization step of polymerizing the component (a) and a subsequent second polymerization step of adding the component (b) thereto and polymerizing these components.

4. (Original) The binder for electrode of lithium ion secondary battery according to claim 3, wherein
the first polymerization step is a step of polymerizing 15 to 80 parts by weight of the component (a) until the polymerization conversion ratio thereof reaches 60 to 97 weight%, and
the second polymerization step is a step of adding 20 to 85 parts by weight of the component (b) thereto (wherein the amount of all the monomers is 100 parts by weight) and polymerizing the components until the polymerization conversion ratio reaches 90 weight% or more of all the monomers.

5. (Original) The binder for electrode of lithium ion secondary battery according to claim 2, wherein the multistage polymerization comprises a three-stage polymerization process.

6. (Original) The binder for electrode of lithium ion secondary battery according to claim 5, wherein the multistage polymerization comprises
a first polymerization step of adding a part of the component (a) and then polymerizing it,
a subsequent second polymerization step of adding thereto the component (b) and polymerizing the components, and

a subsequent third polymerization step of adding thereto the remaining component (a) and polymerizing the components.

7. (Original) The binder for electrode of lithium ion secondary battery according to claim 6, wherein

the first polymerization step is a step of polymerizing 5 to 50 parts by weight of the component (a) until the polymerization conversion ratio thereof reaches 60 to 97weight%,

the second polymerization step is a step of adding 20 to 85 parts by weight of the component (b) thereto and polymerizing the components until the polymerization conversion ratio reaches 60 to 97weight% of all the monomers added up to this step, and

the third polymerization step is a step of adding 5 to 50 parts by weight of the component (a) thereto (wherein the amount of all the monomers is 100 parts by weight) and polymerizing the components until the polymerization conversion ratio reaches 90 weight% or more of all the monomers.

8. (Previously Presented) A slurry composition for electrode of lithium ion secondary battery, which comprises the binder for electrode of lithium ion secondary battery as claimed in claim 1, an active material for an electrode, and an organic liquid medium.

9. (Original) The slurry composition for electrode of lithium ion secondary battery according to claim 8, wherein the organic liquid medium is N-methylpyrrolidone.

10. (Original) A production method for a lithium ion secondary battery electrode, wherein the slurry composition for electrode of lithium ion secondary battery as claimed in claim 8 is applied onto a current collector and then dried.

11. (Previously Presented) A lithium ion secondary battery electrode, wherein an electrode layer comprising the binder for electrode of lithium ion secondary battery as claimed in claim 1 and an active material for an electrode is bonded to a current collector.

12. (Original) A lithium ion secondary battery, which comprises the electrode as claimed in claim 11.

13. (New) A binder for an electrode of a lithium ion secondary battery, which comprises a copolymer obtained by multistage-polymerizing comprising:

(a) 15 to 80 weight % a component comprising at least one ethylenically unsaturated monomer whose homopolymerization yields a polymer soluble in N-methylpyrrolidone (NMP) (component (a)); and

(b) 20 to 85 weight % of a component comprising at least one ethylenically unsaturated monomer whose homopolymerization yields a polymer insoluble in NMP (component (b));

wherein the copolymer exhibits a swelling degree of 4 or below, in an electrolyte obtained by dissolving $LiPF_6$ in the concentration of 1 mole/liter into a solvent of 1:2 (volume ratio at 20°C) mixture of ethylene carbonate (EC) and diethyl carbonate (DEC), and

wherein the multistage-polymerization of the components (a) and (b) comprises two or three steps.

14. (New) The binder for an electrode of a lithium ion secondary battery according to claim 13, wherein the multistage-polymerization of the components (a) and (b) comprises two steps, and wherein a polymerization conversion ratio in the first polymerization step is from 60 to 97 weight %, and a polymerization conversion ratio in the second polymerization step is 90 weight % or more.

15. (New) The binder for an electrode of a lithium ion secondary battery according to claim 13, wherein the multistage-polymerization of the components (a) and (b) comprises three steps, and wherein a polymerization conversion ratio in the first polymerization step is from 60 to 97 weight %, a polymerization conversion ratio in the second polymerization step is from 60 to 97 weight %, and a polymerization conversion ratio in the third polymerization step is 90 weight % or more.